# Table of Contents

## Chapter I—Metabolism and Nutrition

Metabolic Effects of Tumor Necrosis Factor and γ-Interferon Are Not Abrogated by Indomethacin ..... 1
H. Fletcher Starnes, Jr., MD, William A. Larchian, MD, Nancy E. McHugh, MD, Janice L. Gabrilove, MD, and Murray F. Brennan, MD, FACS

In Vivo Macrophage Activation Alters Hepatocyte Metabolism ..... 4
Kathy Kelley, MD, Ray M. Price, PhD, James G. Baxter, PharmD, Steven Steinberg, MD, David Lalka, PhD, and James M. Hassett, Jr., MD, FACS

Infected Burn Injury Alters Hepatic Monokine and Albumin mRNA Contents ..... 6
Michael A. Marano, MD, Yuman Fong, MD, Lyle L. Moldawer, PhD, Joseph P. Minei, MD, He Wei, MD, Chris Keough, BS, Roger Yurt, MD, FACS, Donald A. Fischman, MD, Anthony Cerami, PhD, and Stephen F. Lowry, MD, FACS

Cachectin (Tumor Necrosis Factor-α) Participates in the Metabolic Derangements Induced by Gram-Negative Bacteremia ..... 8
Kevin J. Tracey, MD, Yuman Fong, MD, David G. Hesse, MD, Kirk R. Manogue, PhD, Annette Lee, BS, George C. Kuo, PhD, Steve E. Calvano, PhD, Lyle L. Moldawer, PhD, Michael A. Marano, MD, G. Tom Shires, MD, FACS, Anthony Cerami, PhD, and Stephen F. Lowry, MD, FACS

Hepatic Blood Flow and Splanchnic Oxygen Consumption Measurements in Clinical Sepsis ..... 10
Michael S. Dahn, MD, FACS, Larry N. Diebel, MD, and Robert F. Wilson, MD, FACS

Hepatocytes Release Factors That Can Modulate Macrophage IL-1 Secretion and Proliferation ..... 13
John E. Mazuski, MD, Paul E. Bankey, MD, Ann Carlson, BA, and Frank B. Cerra, MD, FACS

TNF and Endotoxin: Cross-Tolerance by Different Mechanisms ..... 15
Douglas L. Fraker, MD, and Jeffrey A. Norton, MD, FACS

Effect of Age on the Metabolic Responses to Surgery..... 18
James M. Watters, MD, FRCS(C), Dennis Desai, MD, and Mary L. Redmond, MD, FRCS(C)

Splanchnic Monokine and Metabolic Response to Endotoxin in Man ..... 21
Yuman Fong, MD, Michael A. Marano, MD, Lyle L. Moldawer, PhD, He Wei, MD, E. Diane Bushman, BS, Dwight E. Matthews, PhD, G. Thomas Shires, MD, FACS, Anthony Cerami, PhD, and Stephen F. Lowry, MD, FACS

Platelet-Activating Factor Antagonist CV 3988 Prevents Hepatocellular Membrane Dysfunction During Live *E Coli* Bacteremia..... 24
Joseph P. Minei, MD, G. Tom Shires III, MD, FACS, Daniel B. Jones, BA, and G. Tom Shires, MD, FACS

Activation of Macrophages by L-Lactic Acid ..... 27
Philip B. Paty, MD, Michael J. Banda, PhD, and Thomas K. Hunt, MD, FACS

An Immunoprotective Antibody Directed Against Lipopolysaccharide Inhibits Tumor Necrosis Factor Production In Vitro ..... 29
Brian P. Priest, MD, Paul E. Bankey, MD, Frank B. Cerra, MD, FACS, and David L. Dunn, MD, PhD

Low-Protein Diets Improve Survival From Peritonitis in Guinea Pigs..... 31
Michael D. Peck, MD, J. Wesley Alexander, MD, ScD, FACS, Sara J. Gonce, BA, BS, and Phillip W. Miskell, BA, BS

Calculation of Subcutaneous Tissue Blood Flow ..... 33
Harriet Williams Hopf, MD, J. Arthur Jensen, MD, and Thomas K. Hunt, MD, FACS

Inhibition by Insulin of Myofibrillar Protein Breakdown in Septic Skeletal Muscle..... 36
Daniel W. Benson, MD, Per-Olof Hasselgren, MD, PhD, J. Howard James, BS, Jeffrey M. Nelson, PhD, and Josef E. Fischer, MD, FACS

Decreased β-Adrenergic-Stimulated Lipolysis With Endotoxemia..... 38
Sarkis Meterissian, MD, Dickens Saint Vil, MD, and R. Armour Forse, MD, PhD, FRCS(C), FACS

Nutritional Support of the Critically Ill: How Much Nitrogen? ..... 41
Palmer Q. Bessey, MD, FACS

Glutamine-Enriched Parenteral Nutrition Prevents Mucosal Atrophy Following Massive Small Bowel Resection ..... 44
Xiang-Dong Wang, MD, Danny O. Jacobs, MD, Sarah T. O'Dwyer, FRCS(E), R. J. Smith, MD, and Douglas W. Wilmore, MD, FACS

Glutamine-Supplemented Elemental Diets Reduce Endotoxemia in a Lethal Model of Enterocolitis..... 46
Andrew D. Fox, MD, Juan A. De Paula, MD, Scott A. Kripke, MD, J. Camilo Palacio, MD, Jeffrey M. Berman, BA, R. Gregg Settle, PhD, and John L. Rombeau, MD, FACS

Inhibition of TPN-Associated Colonic Atrophy With β-Hydroxybutyrate ..... 48
Scott A. Kripke, MD, Andrew D. Fox, MD, Jeffrey M. Berman, BA, Juan A. De Paula, MD, John L. Rombeau, MD, FACS, and R. Gregg Settle, PhD

Determination of Body Composition From Whole Body Electrical Impedance..... 50
Richard R. Jodoin, MD, Steven G. Trott, MD, and Harry M. Shizgal, MD, FRCS(C), FACS

Reduction of Glucagon-Induced Leucine Oxidation by Bradykinin ..... 53
Wolfgang H. Hartl, MD, Hiroshi Miyoshi, MD, Farook Jahoor, PhD, and Robert R. Wolfe, PhD

Insulin-Induced Hypoglycemia: A Model for the Study of Enhanced Proteolysis ..... 55
Hisham Hourani, MD, Philip Williams, BS, Richard Geer, MD, Maria Frexes-Steed, MD, Ibrahim Melki, MD, John A. Morris, MD, FACS, and Naji N. Abumrad, MD, FACS

Does Immediate Total Parenteral Nutritional Influence Wound Healing in Rats With Skeletal Trauma?..... 58
E. Teh, BSChE, H. M. Delany, MD, FACS, A. A. Demetriou, MD, PhD, FACS, and S. M. Levenson, MD, FACS

## Chapter II—Critical Care and Infection

Successful Use of an Anti-Platelet-Activating Factor Agent in the Porcine *Pseudomonas* ARDS Model..... 61
Karl Byrne, MD, FRCS(I), Harvey J. Sugerman, MD, FACS, James L. Tatum, MD, Charles L. Blocher, BS, Alberto Vasquez, MD, and Jeffrey Young, MD

Effect of Bactericidal Antibiotic Therapy on Plasma Endotoxin Concentration and Mortality Rate During Acute *E Coli* Bacteremic Shock in the Pig..... 63
Thomas Tomasik, MD, Paul O'Keefe, MD, Jill Gordey, BS, Nicholas King, BS, and Richard M. Raymond, PhD

Hypertonic Saline Dextran Resuscitation of Thermal Injury ..... 67
Jureta W. Horton, PhD, D. Jean White, MS, and Charles R. Baxter, MD, FACS

Immediate Effects and Late Outcomes of the Treatment of Hypovolemic Patients With Hypertonic Saline: A Prospective Double-Blind Study in 105 Patients..... 70
Riad N. Younes, MD, Frederico Aun, MD, FACS, Claudia Q. Accioly, Luciano P. L. Casale, Israel Szajnbok, and Dario Birolini, MD, FACS

The Myth of Hyperglycemia-Induced Plasma Volume Expansion During Shock ..... 73
Jonathan M. Saxe, MD, Zhi Xing Guan, MD, Dennie Grabow, BS, Anna M. Ledgerwood, MD, FACS, and Charles E. Lucas, MD, FACS

Intravenous But Not Intragastric Epidermal Growth Factor Inhibits Acid Secretion ..... 75
Urban Wingren, MD, PhD, Gerald M. Larson, MD, Cindie J. Greaton, PhD, and Gregory S. Schultz, PhD

Improved Wound Healing Through the Local Delivery of Tumor Necrosis Factor ..... 77
David P. Mooney, MD, Richard L. Gamelli, MD, FACS, and Michael O'Reilly, BA

Effect of Lipopolysaccharide on Intestinal Intramucosal pH in Pigs: Evidence of Gut Ischemia Despite Normal Cardiac Output and Mesenteric Oxygen Consumption ..... 80
Mitchell P. Fink, MD, FACS, Stephen M. Cohn, MD, Patrick C. Lee, MD, Heidie R. Rothschild, BS, Yamo F. Deniz, BS, Hailong Wong, MD, and Richard G. Fiddian-Green, MD, FACS

Detection of Hyperoxia-Induced, Xanthine Oxidase-Mediated Endothelial Cell Injury by Factor VIII Release ..... 82
Ronald H. Miles, MD, Michael A. Grosso, MD, James M. Brown, MD, Mark L. Helm, MD, Anirban Banerjee, PhD, John E. Repine, MD, and Alden H. Harken, MD

Endotoxin-Mediated Endothelial Injury: Potential Mechanism as a Calcium Ionophore ..... 85
Richard J. Bloom, MD, Lawrence M. Simon, MD, and William Benitz, MD

Effects of Hyperbaric Oxygen on Adenosine Triphosphate in Thermally Injured Skin ..... 87
Richard J. Stewart, MA, Kent T. Yamaguchi, MD, Paul A. Cinanci, MD, Patrick M. Knost, BA, Sepehr Samadani, BA, Stewart W. Mason, and Baback Roshdieh

Energy Metabolism During Ischemia Reperfusion Is Inhibited by Oxygen Radical Metabolites ..... 90
Anirban Banerjee, PhD, Michael A. Grosso, MD, Jamie M. Brown, MD, John E. Repine, MD, Alden H. Harken, MD, and Glenn J. Whitman, MD

Platelet-Derived Growth Factor Selectively Induces PMN Complement Receptors Without Stimulating Superoxide Production or Exocytosis ..... 92
Julio Garcia-Aguilar, MD, Glenn E. Brown, PhD, and Marc E. Lanser, MD

Effect of Blood Transfusion and Starvation on Susceptibility to Infection ..... 94
Charles R. Shumate, MD, David H. Livingston, MD, and Mark A. Malangoni, MD, FACS

In Vivo Effects of an Immunosuppressive Factor Isolated From Patients Following Thermal Injury ..... 96
Paul G. Horgan, MB, BCh, FRCS (I), FRCS (Glas), Mary L. Rodrick, PhD, Kevin Ellwanger, BSc, Katherine C. Collins, BSc, Dominik B. Dubravec, DDS, and John A. Mannick, MD, FACS

Potential Role for Neutrophil-Endothelial Cell Adherence in the Pathogenesis of Sepsis .....100
David K. Magnuson, MD, Timothy H. Pohlman, MD, and Ronald V. Maier, MD, FACS

*Bacteroides Fragilis* Induces Procoagulant Activity by Macrophages: A Potential Mechanism for Abscess Formation .....103
Gary A. Rosenthal, MD, Gary Levy, MD, and Ori D. Rotstein, MD, FRCS(C)

Intraperitoneal Administration of Recombinant Interleukin-2 Protects Against Lethal IP Gram-Negative Sepsis by Induction of Neutrophil Influx.....105
Michael A. Maddaus, MD, and Richard L. Simmons, MD

Tissue Plasminogen Activator Reverses the Infection-Induced Reduction in Colonic Anastomotic Healing.....107
Ori D. Rotstein, MD, FRCS(C), and Kimberly A. Houston, MSc

Bombesin Inhibits Bacterial Translocation From the Gut in Burned Rats .....109
Jesse A. Coffey, Jr., MD, Rusty A. Milhoan, MD, Ahmed Abdullah, MD, David N. Herndon, MD, FACS, Courtney M. Townsend, Jr., MD, FACS, and James C. Thompson, MD, FACS

In Vivo Activation of Kupffer Cells by Endotoxin Causes Suppression of Nonspecific, but Not Specific Systemic Immunity.....111
John C. Marshall, MD, FRCS(C), Harold Rode, PhD, Nicolas V. Christou, MD, PhD, FRCS(C), FACS, and Jonathan L. Meakins, MD, DSc, FRCS(C), FACS

Immunoprotective Effects of Cyclooxygenase Inhibition in Patients With Major Surgical Procedures.....114
Eugen Faist, MD, Wolfgang Ertel, MD, Tina Cohnert, MD, Peter Huber, PhD, Dietrich Inthorn, MD, and Georg Heberer, MD, FACS

Effect of Endotoxin and Trauma on Survival After Cecal Ligation and Puncture in Mice .....116
Christopher C. Baker, MD, FACS, and Cheryl L. Caragnano, BA

## Chapter III—Gastrointestinal Tract, Liver, Pancreas, Biliary Tract, and Associated Hormones

Mechanisms of Sensory Responses to a Noxious Chemical Stimulus (Capsaicin) of the Canine Distal Esophagus ..... 119
Anthony D. Sandler, MD, Jerry F. Schlegel, BS, Mardi R. Karin, MD, and James W. Maher, MD, FACS

Alcohol Ablates Esophageal Mucosal Blood Flow ..... 121
Barbara L. Bass, MD, Jo Ellen Huesken, MS, Eugene J. Schweitzer, MD, Sheila Wall, BS, and John W. Harmon, MD, FACS

Effect of Verapamil on the Gastric Mucosal Level of $PGE_2$ During Stress ..... 123
Harris R. Sterman, MD, Louis-Joseph Auguste, MD, Theodore A. Stein, PhD, Beverly Bailey, BS, and Leslie Wise, MD

Association of Massive Pepsin Release With "Stress" Gastritis ..... 125
Marc D. Basson, MD, Jeffrey Sussman, MD, Thomas E. Adrian, PhD, MRCPath, and Irvin M. Modlin, MD, FRCS, FACS

Differences Between Misoprostol and 16,16-Dimethyl Prostaglandin $E_2$ in Stimulation of Gastric $HCO_3^-$ Secretion ..... 128
Merril T. Dayton, MD, FACS, and Kenneth R. Larson, PhD

Evidence That Prostaglandins Prevent Surface Epithelial Cell Exfoliation From the Gastric Mucosa ..... 130
John D. Cunningham, MD, Richard E. Milner, BS, and Wallace P. Ritchie, Jr., MD, PhD, FACS

Serorrhaphy Prevents Gastric Reinnervation After Proximal Gastric Vagotomy ..... 132
Junichi Yoshida, MD, Edward H. Polley, PhD, Lloyd M. Nyhus, MD, FACS, and Philip E. Donahue, MD, FACS

Pathways of $Cl^-$ Transport in Gastric Surface Epithelium: Evaluation Using Intracellular Microelectrode Techniques ..... 134
David Soybel, MD, Stanley Ashley, MD, and Laurence Cheung, MD, FACS

Accelerated Gastric Emptying in the Portal Hypertensive Rat ..... 136
James A. Reilly, Jr., MD, Eamonn M. M. Quigley, MD, Rodney S. Markin, MD, and Layton F. Rikkers, MD, FACS

Prostacyclin Modulates the Hemodynamics of Acute Portal Hypertension ..... 139
James V. Sitzmann, MD, FACS, Shao-Sen Li, MD, and Pin-Wen Lin, MD

Perioperative Adriamycin and Gastrointestinal Healing ..... 141
Donna Showers, MD, Richard Sterling, MD, and Daniel T. Dempsey, MD

Postprandial Neuropeptide Y Release in the Conscious Dog ..... 143
David W. McFadden, MD, Michael S. Nussbaum, MD, Marek Rudnicki, MD, Ambipakan Balasubramaniam, PhD, and Josef E. Fischer, MD, FACS

Myoelectric Response of the Sphincter of Oddi to Products of Fat Digestion ..... 146
Jose E. Parodi, MD, Claudia L. Corwin, MD, Michael E. Zenilman, MD, and James M. Becker, MD, FACS

Effect of Glucagon on Hepatic Biliary Secretion in Humans.....148
Bert A. Bowers, MD, Christopher R. Watters, MD, Francis S. Rotolo, MD, Gene D. Branum, MD, Douglas A. Wilson, MD, and William C. Meyers, MD, FACS

Altered $Na^+$ and $Cl^-$ Transport During Mixed Gallstone Formation.....150
Seth D. Strichartz, MD, Mohammad Z. Abedin, PhD, Sarkis F. Festekdjian, and Joel J. Roslyn, MD, FACS

Alterations in the Bile Salt Profile During Stone Formation in a Model of Pigment Gallstones.....152
Lillian G. Dawes, MD, David L. Nahrwold, MD, FACS, and Robert V. Rege, MD, FACS

Estrogen Alters Biliary Calcium Metabolism and Induces Pigment Sludge.....154
Thomas H. Magnuson, MD, Keith D. Lillemoe, MD, George E. Peoples, MD, Luyi Li, MD, and Henry A. Pitt, MD, FACS

Indomethacin Inhibition of Abnormal Gallbladder In Vitro Fluid Absorption in a Rabbit Model of Early Acute Cholecystitis.....156
Stuart I. Myers, MD, and Lori B. Parks, BS

Biliary Motility in the Earliest Stages of Gallstone Formation.....158
William C. Chapman, MD, George A. Peterkin III, MD, Wayne W. LaMorte, MD, PhD, and Lester F. Williams, Jr., MD, FACS

Alterations in Immune Formation in Biliary Obstruction.....160
Carol E. H. Scott-Conner, MD, PhD, FACS, and James B. Grogan, PhD

Islet Cell Differentiation and Proliferation Induced by a Pancreatic Cytosol Extract ..... 162
David Clas, MD, William P. Duguid, MB, ChB, FRCPath, Elizabeth Malashenko, and Lawrence Rosenberg, MD, MSc, PhD, FRCS(C)

Neuronal Involvement in Methionine Enkephalin Inhibition of Pancreatic Exocrine Secretion ..... 164
Michael W. Mulholland, MD, and W. Scott Helton, MD

Peripheral Thyrotropin-Releasing Hormone Selectively Stimulates Pancreatic Bicarbonate Secretion by a Vagal Mechanism ..... 166
Sean J. Mulvihill, MD, and Haile T. Debas, MD

Transitional Mucosa: Cause or Result of Human Colon Carcinogenesis? ..... 168
Richard B. Hostetter, MD, Karen R. Cleary, MD, and J. Milburn Jessup, MD, FACS

Mechanism of Impaired Sodium Absorption in Colon Cancer ..... 170
Horacio Asbun, MD, Ciro Pempinello, MD, William Funkhouser, MD, Larry Mier, MD, and Richard J. Davies, MD, FACS

Bactericidal Efficacy of Various Bowel Preparation Techniques on the Microflora of the Colonic Lumen and Mucosa ..... 173
John T. Lindsey, MD, Jeffrey W. Smith, MS, MPH, Sam G. McClugage, Jr., PhD, Luciana M. Vivoda, MS, MPH, and Ronald Lee Nichols, MD, FACS

Hyperplasia of Colonic Mucosa and Pancreas After Ileocecal Resection Is Not Caused by Gastrin ..... 177
John P. Lawrence, MD, Graeme J. Poston, FRCS, Elena James, BS, Courtney M. Townsend, Jr., MD, FACS, and James C. Thompson, MD, FACS

Effect of the Duration of Urogastrone Infusion on Intestinal Regeneration ..... 180
Jon S. Thompson, MD, FACS, Sahilendra K. Saxena, MD, and John G. Sharp, PhD

Differential Release of Peptide YY From Colonic Endocrine Cells: A Unique, Specific and Nonneurally Mediated Mechanism ..... 182
Walter E. Longo, MD, Garth H. Ballantyne, MD, Alexander P. Vukasin, Anton J. Bilchik, MD, Thomas E. Adrian, PhD, and Irvin M. Modlin, MD

D-Ala$^2$-Metenkephalinamide Causes Absorption of Water and Electrolytes in the Isolated Perfused Ileum ..... 184
J. Augusto Bastidas, MD, Charles J. Yeo, MD, Robert E. Schmieg, Jr., BS, and Michael J. Zinner, MD, FACS

Serotonin Induces Contraction in Circular and Longitudinal Muscle Cells of the Intestine by Different Mechanisms ..... 186
Daniel C. Martin, MD, John M. Kellum, MD, FACS, and John R. Grider, PhD

Bacterial Translocation and Mesenteric Blood Flow in a Large Animal Model After Cutaneous Thermal and Smoke Inhalation Injury ..... 189
Stephen E. Morris, MD, Neville Navaratnam, FRCS, Courtney M. Townsend, Jr., MD, FACS, and David N. Herndon, MD, FACS

Effect of Vasopressin and Isoproterenol on the
Capacity of the Duodenum to Clear an Acid Load ..... 191
Marion Schertzer, MD, David Bruch, MS,
and Raphael S. Chung, MD, FACS

Comparison of Lipoprotein Results in Men and Women
After Partial Ileal Bypass for Hypercholesterolemia ..... 193
Christian T. Campos, MD, John P. Matts, PhD,
Laurie L. Fitch, MPH, Jane C. Speech, MS,
John M. Long, EdD, Henry Buchwald, MD, PhD, FACS,
and the POSCH Group

## Chapter IV—Cardiothoracic Surgery

Enhanced 24-Hour In Vitro Heart Preservation
With Adenosine and AMP ..... 196
Dimitri Petsikas, MD, Michael A. Ricci, MD,
Richard Baffour, PhD, Benoit deVarennes, MD,
Ray C. J. Chiu, MD, FACS, James F. Symes, MD, FACS,
and Albert J. Guerraty, MD, FACS

Effects of Right Atrial Retrograde Cardioplegia
on Preservation of the Ischemic Right Ventricle Following
Acute Coronary Artery Occlusion and Reperfusion..... 198
Elliot Kaplan, MD, Arthur R. Dresdale, MD,
Andreas Kreis, MD, Marvin A. Konstam, MD,
Ian M. Ross, CCP, Mark J. Aronovitz, BA,
Nicholas A. Katzen, MD, Raymond J. Connolly, PhD,
Natesa G. Pandian, MD, Douglas D. Payne, MD,
Richard J. Cleveland, MD, FACS, and James T. Diehl, MD

Preservation of Postischemic Cardiac Function by Deferoxamine Is Age Dependent ..... 200
Hiroomi Nakamura, MD, Pedro J. del Nido, MD, Richard W. Illes, MD, Irv B. Krukenkamp, MD, Norman A. Silverman, MD, FACS, and Sidney Levitsky, MD, FACS

Effect of Superoxide Dismutase and Catalase Cardioplegia on Left Ventricular Contractility and Compliance in the Isolated Rabbit Heart After Three Hours of Cold Ischemic Storage ..... 202
Luis D. Berrizbeitia, MD, Samuel Rivers, BS, Harold L. Lazar, MD, FACS, and Richard J. Shemin, MD, FACS

Coronary Sinus Delivery of Cardioplegic Solution Containing Metabolic Inhibitors for Protection of Ischemic Myocardium ..... 204
Gert E. Tuchy, MD, Michael E. Jessen, MD, FRCS(C), Anwar S. Abd-Elfattah, PhD, Scott A. Hanan, MD, Ricky P. Maddox, AB, and Andrew S. Wechsler, MD, FACS

Optimal Recovery of Postischemic Myocardial Function With Low Oxygen Reperfusion ..... 207
Lawrence L. Creswell, MD, Peter S. Greene, MD, Elaine M. Griffiths, MB, Joseph M. Dinatale, BS, Vincent L. Gott, MD, FACS, and Timothy J. Gardner, MD, FACS

Effects of Chronic Amiodarone Administration on Cardiac Function Following Hypothermic Global Ischemia in the Rat Heart ..... 210
Marc E. Mitchell, MD, Robert C. Robbins, MD, John P. Kupferschmid, MD, and Richard E. Clark, MD, FACS

Amiodarone Inhibits Myocardial Response to Inotropic Stimulation ..... 213
William C. Buhrman, MD, David W. Molter, MD, R. Duane Davis, Jr., MD, Gregory P. Fontana, MD, Robin G. Cummings, MD, and James E. Lowe, MD

Optimal Dose of Superoxide Dismutase in Hypothermic Global Myocardial Ischemia ..... 216
Robert B. Lee, MD, James R. Stewart, MD, Samuel A. Morley, Jr., BS, Walter H. Merrill, MD, FACS, William H. Frist, MD, John W. Hammon, Jr., MD, FACS, and Harvey W. Bender, Jr., MD, FACS

Regional Cardioplegic Arrest During Early Reperfusion Accelerates Recovery From Myocardial Stunning ..... 218
Daniel L. Miller, MD, Thomas A. Martin, MD, S. Kristina Wahlstrom, Mark A. Knox, Lisa C. Bachenheimer, MD, Gary L. Schaer, MD, and Marc S. Visner, MD

Superiority of Blood Cardioplegia Over Crystalloid Cardioplegia in Limiting Reperfusion Damage: Importance of Endogenous Oxygen Free-Radical Scavengers in Red Blood Cells ..... 221
Pierre L. Julia, MD, Marshall T. Partington, MD, Gerald D. Buckberg, MD, Christophe Acar, MD, Michael P. Sherman, MD, Edward R. Kofsky, MD, Helen I. Bugyi, PhD, and Helen Young, PhD

Sarcoplasmic Reticulum $Ca^{2+}$ Uptake: A Biochemical Marker of Stunned Myocardium ..... 224
Peter S. Greene, MD, David L. Johnson, MD, Dawn C. Borsi, BS, Yvonne I. Fisher, BS, Thomas J. J. Blanck, MD, PhD, and Timothy J. Gardner, MD, FACS

Profound Hypothermia and Hyperkalemic Cardioplegia, Regardless of $Na^+$ or $Ca^{2+}$ Content, Provides the Best Protection of the Neonatal Heart ..... 226
Maurizio Diaco, MD, Shu-Chung Sun, MD, Stanley Tam, MD, Rita Laurence, BS, and Lawrence H. Cohn, MD, FACS

Pediatric Myocardial Protection: Adult Versus Newborn Sensitivity to Extracellular Calcium ..... 230
John S. Ikonomidis, Pedro R. Salerno, MD, Ingeborg C. Radde, MD, PhD, FRCP(C), Jeffrey S. Main, BSc, and Carin Wittnich, DVM, MSc

Oxygen Consumption in the Empty Beating, Fibrillating, and Potassium-Chloride Arrested Neonatal Heart..... 233
Michael E. Jessen, MD, FRCS(C), Scott A. Hanan, MD, Anwar S. Abd-Elfattah, PhD, Gert E. Tuchy, MD, Ricky P. Maddox, AB, and Andrew S. Wechsler, MD, FACS

Is the Negative Inotropic Effect of Verapamil Accentuated by Ischemic Arrest and Reperfusion? ..... 235
Jay P. Mashburn, MD, Kazuhiro Hashimoto, MD, and Hartzell V. Schaff, MD, FACS

Differences in Tolerance to Total Ischemia in Hypertrophied Myocardium Secondary to Aortic Insufficiency and Aortic Stenosis..... 237
R. Duane Davis, Jr., MD, Mark R. Bladergroen, MD, Gregory P. Fontana, MD, J. Alan Menius, BS, Robin G. Cummings, MD, and James E. Lowe, MD

Medical Versus Surgical Reperfusion in Acute Myocardial Infarction ..... 240
Paul K. Davis, MD, Walter E. Pae, MD, FACS, Salvatore A. Parascandola, MD, Cynthia A. Miller, BS, Robert K. Wise, BS, G. Allen Prophet, BS, and John A. Waldhausen, MD, FACS

Right Ventricular Function Using Thermodilution ..... 242
Francis G. Spinale, MS, PhD, Alison C. Smith, DVM,
Blase A. Carabello, MD, and Fred A. Crawford, Jr., MD, FACS

Preload Dependence of Right Ventricular Myocardial
Blood Flow: Autoregulatory Range of
Perfusion Pressure ..... 244
Louis A. Brunsting, MD, Michael E. Jessen, MD, FRCS(C),
Jon Lekven, MD, Jeffrey C. Hoehner, MD,
Cornelius M. Dyke, MD, and Andrew S. Wechsler, MD, FACS

Effect of Dopamine on the Relation Between
Regional Function and Regional Myocardial
Oxygen Consumption ..... 247
Peter M. Scholz, MD, FACS, Joseph K. Kedem, PhD,
Joel Joselevitz-Goldman, MD, Harvey R. Weiss, PhD,
and James W. Mackenzie, MD, FACS

Effects of Neutrophil Depletion in Limiting
Reperfusion Damage ..... 249
Edward R. Kofsky, MD, Pierre L. Julia, MD,
Gerald D. Buckberg, MD, Helen I. Bugyi, PhD,
Helen Young, PhD, and James Quillen, MD

Ventricular Atriopeptin Release From the Hypertrophic
Isolated Rat Heart ..... 252
Paul T. Stockman, MD, and Philip Needleman, PhD

Quantitative Analysis of Regional Systolic Function
With Left Ventricular Aneurysm ..... 254
Alfred C. Nicolosi, MD, and Henry M. Spotnitz, MD, FACS

Computerized Potential Distribution Mapping for Rapid Localization of Ventricular Tachycardia of Septal Origin ..... 257
James S. Tweddell, MD, Atsushi Harada, MD, Richard B. Schuessler, PhD, Constance M. Stone, MD, Chris K. Rokkas, MD, Barry H. Branham, MS, John P. Boineau, MD, and James L. Cox, MD, FACS

Effect of Preoperative Recombinant Human Erythropoietin on Postoperative Erythropoiesis ..... 260
Edward A. Levine, MD, Steven A. Gould, MD, FACS, Arthur L. Rosen, PhD, Lakshman R. Sehgal, PhD, Joan C. Egrie, PhD, Hansa L. Sehgal, BS, and Gerald S. Moss, MD, FACS

Evaluation of Myocardial Perfusion During Coronary Artery Bypass Grafting Using Intraoperative Contrast Echocardiography ..... 262
J. Scott Kabas, MD, Conrad L. Flick, BS, Joseph A. Kisslo, MD, Stewart M. Scott, MD, Gulshan Sethi, MD, and Peter K. Smith, MD

Correction of Moderate Mitral Regurgitation Does Not Decrease Left Ventricular Contractility ..... 264
Paul D. Robison, MD, Frederick L. Grover, MD, FACS, Gregory Freeman, MD, Michael H. Crawford, MD, Daryl Stewart, MD, Kathy Evans, VTR, David J. Cohen, MD, FACS, and J. Kent Trinkle, MD, FACS

Cyclosporin Causes Endothelial Cell Injury: A Mechanism for Vascular Complications After Transplantation ..... 268
Daniel J. Ledbetter, MD, Michael A. Reidy, PhD, and David Tapper, MD

$^{31}$P NMR Bioenergetic Changes in Rejecting Heterotopic Heart Transplants Are Reversible With Augmented Immunotherapy.....270
Charles D. Fraser, Jr., MD, V. P. Chacko, PhD, William E. Jacobus, PhD, Ravi Pillai, MD, Ko Bando, MD, Renate L. Soulen, MD, Grover M. Hutchins, MD, Bruce A. Reitz, MD, FACS, and William A. Baumgartner, MD, FACS

Comparison of Nifedipine and Nitroprusside for the Treatment of Postoperative Hypertension.....272
Peter L. Birnbaum, MD, Gerry O'Leary, MD, Richard D. Weisel, MD, John C. Mullen, MD, M. Mindy Madonik, BSc, Joan Ivanov, RN, Patricia Young, RN, and Sallie J. Teasdale, MD

Pneumatic Aortic Counterpulsator Powered by a Skeletal Muscle Ventricle: 22- to 42-Day Experience.....276
William A. Anderson, MD, Charles R. Bridges, MD, ScD, Alvin J. Chin, MD, James S. Andersen, MD, Michael A. Acker, MD, Robert L. Hammond, BA, and Larry W. Stephenson, MD

Hemodynamic Effects of Chronically Stimulated Skeletal Muscle on the Dysfunctional Canine Left Ventricle.....278
Lester C. Permut, MD, Ira L. Siegman, MD, Julie A. Swain, MD, FACS, and Richard E. Clark, MD, FACS

Effects of the Left Ventricular Assist Device on Right Ventricular Function.....280
Joseph R. Elbeery, MD, Clarence H. Owen, BA, Michael A. Savitt, MS, F. W. Clevenger, MD, and Peter VanTrigt, MD

Percutaneous Pulmonary Artery Balloon Counterpulsation: Pathologic Studies on the Heart and Lungs After Assistance for 24 Hours of Counterpulsation.....284
Pedro R. Salerno, MD, Joan M. Sweet, MD, FRCP(C), FACP, Robert J. Cusimano, MD, Kassem Ashe, MD, and Tomas A. Salerno, MD, FACS

Ischemia of the Interventricular Septum: A Mechanism of Right Ventricular Failure During Mechanical Left Ventricular Assist.....286
Richard C. Daly, MD, Krishnaswamy Chandrasekaran, MD, Nicholas C. Cavarocchi, MD, A. Tamil Tajik, MD, and Hartzell V. Schaff, MD, FACS

Decreased Vascular Compliance After Reimplantation of the Left Lower Lobe in Young Pigs.....288
Alan M. Johnson, MD, W. Gerald Teague, MD, Gary W. Barone, MD, Terry L. Flanagan, MPH, Bonnie J. White, RN, Eugene D. McGahren, MD, and Irving L. Kron, MD, FACS

The Effect of Variable Preload on Left Ventricular Function in a Single Cannula System for Extracorporeal Membrane Oxygenation .....291
Michael G. Moront, MD, Martin Keszler, MD, Ali Analouei, PhD, Cynthia Cox, RN, NNP, Mary Milewski, RN, NNP, and Marc S. Visner, MD

Pulmonary Edema After Cardiopulmonary Bypass: A Protamine-Induced Adult Respiratory Distress Syndrome .....293
Alan R. Koslow, MD, Magid D. Farid, MB, CLB, David O. DeFouw, PhD, Richard N. Feinberg, PhD, G. Richard Curl, MD, and Robert W. Hobson, MD, FACS

Isoproterenol Reverses Dynamic Airway and Vascular Obstruction in the Reimplanted Porcine Lobe ..... 295
W. Gerald Teague, MD, Gary W. Barone, MD, Eugene D. McGahren, MD, Michael Conerly, MD, Terry L. Flanagan, MPH, Bonnie J. White, RN, and Irving L. Kron, MD, FACS

Mucociliary Function in Autotransplanted, Allotransplanted, and Sleeve-Resected Lungs ..... 298
Andreas Paul, MD, Daniel Marelli, MD, Hani Shennib, MD, FRCS(C), Malcolm King, PhD, Nai-San Wang, MD, PhD, James S. Wilson, MD, FRCS(C), David S. Mulder, MD, FRCS(C), FACS, and Ray Chu-Jeng Chiu, MD, PhD, FRCS(C), FACS

Effects of One-Lung Ventilation on Hemodynamic Data Obtained From the Swan-Ganz Catheter ..... 300
Glen F. Strickland, MD, Brian K. Waltman, MD, Darryl S. Weiman, MD, FACS, Kenneth G. Varley, MD, Carlton A. Hornung, PhD, MPH, and James L. Haynes, MD, FACS

## Chapter V—Vascular Surgery

Effect of Ultraviolet B Irradiation on Vein Allografts: Changes in Endothelial Ultrastructure and Class II Antigen Expression ..... 302
Michael L. Marin, MD, Ronald E. Gordon, PhD, Keith Reemtsma, MD, FACS, Mark A. Hardy, MD, FACS, and Alan I. Benvenisty, MD, FACS

Separation of Reperfusion Injury From
Ischemia-Induced Necrosis ..... 306
Gregory Hayes, MD, FRCS(C), Shinta Liauw, MSc,
Alexander Romaschin, PhD,
and Paul M. Walker, MD, PhD, FRCS(C)

Reperfusion Injury in Skeletal Muscle:
Myth or Reality? ..... 308
Michael Belkin, MD, Richard Brown, BA,
Wayne W. LaMorte, MD, PhD,
and Robert W. Hobson II, MD

Differential Ablation of Arterial Wall Components
With a Pulsed $CO_2$ Laser ..... 311
Glenn M. LaMuraglia, MD, Joseph T. Walsh, Jr., MS,
Martin R. Prince, MD, and Kenton W. Gregory, MD

Long-Term Effects of Laser Energy and Diet
on Arterial Wall ..... 313
Renee S. Hartz, MD, FACS, Walter McCarthy, MD,
Joseph LoCicero III, MD, FACS, Arnold Yashar, MS,
Shou-Ren Shih, MD, and Hau C. Kwaan, MD

Cryopreservation and Transplantation of Arterial Allografts ..... 317
Gary M. Gross, MD, FACS, Guillermo A. Herrera, MD,
Kathleen Wier, BS, Sandra J. Phillips, BS,
and Arnold G. Diethelm, MD, FACS

Modified Low-Density Lipoprotein Isolated From
Fresh Human Atherosclerotic Plaque ..... 319
Hobart W. Harris, MD, MPH, Joseph H. Rapp, MD, FACS,
Steven T. Kunitake, PhD, William C. Krupski, MD, FACS,
and John P. Kane, MD, PhD

Laser Angioplasty With Real-Time Ultrasound ..... 321
Steven H. Silverman, MD, Adib I. Khoury, MS,
Chris J. Mladinich, DVM, George S. Abela, MD,
and James M. Seeger, MD

Effects of Fish Oil Fatty Acid Ingestion
in Patients With Raynaud's Syndrome.....324
Benjamin B. Chang, MD, Ralph DiGiacomo, MD,
Joel Kremer, MD, Carolyn Kay, LPN,
and Dhiraj M. Shah, MD, FACS

Verapamil Reduces Intimal Hyperplasia in Experimental
Vein Bypass Grafts.....326
Mostafa El-Sanadiki, MB, MS,
K. Simon Cross, MB, FRCS(I),
Eileen M. Mikat, PhD, Richard L. McCann, MD,
and Per-Otto Hagen, PhD

Quantitative Inverse Correlation of Wall Shear
Stress With Experimental Intimal Thickening .....328
Hisham S. Bassiouny, MD, Barry B. Leiber, PhD,
Don P. Giddens, PhD, C. P. Xu, MD,
Seymour Glagov, MD, and Christopher K. Zarins, MD

Compliance Changes in Bioresorbable Vascular
Prostheses After Implantation .....330
Si M. Pham, MD, Samuel J. Durham, MD,
Ronald Johnson, MD, David Showalter, MD,
Eric D. Endean, MD, David A. Vorp, BSE,
Harvey S. Borovetz, PhD, and Howard P. Greisler, MD, FACS

Cryopreserved Internal Mammary Artery Allografts
for Coronary Artery Bypass: Studies of
Platelet and Fibrinogen Deposition and
Graft Patency.....333
Patrick M. McCarthy, MD, Hartzell V. Schaff, MD, FACS,
Harvey Bank, PhD, and Mrinal K. Dewanjee, MD, PhD

Response of Human Venous Endothelial Cells to
Seeding on Extracellular Matrices.....335
Jon C. Bowersox, MD, PhD, and Charles A. Andersen, MD, FACS

A New Class of Thromboresistant Biomaterial for Blood Contact ..... 337
Elliot L. Chaikof, MD, James E. Coleman, MB, FRCS(I), Cynthia Sung, MS, Raymond J. Connolly, PhD, Edward W. Merrill, DSc, and Allan D. Callow, MD, PhD, FACS

Revascularization of the Chronically Ischemic Rabbit Hind Limb With a Muscle Pedicle Flap ..... 340
William C. Pevec, MD, Douglas Hendricks, MD, Kenneth C. Shestak, MD, David L. Steed, MD, FACS, and Marshall W. Webster, MD, FACS

Postischemic Reperfusion Injury in Skeletal Muscle: Role of Oxygen Free Radicals ..... 342
James W. Long, Jr., MD, PhD, Jerry L. Laster, MD, Russell P. Stevens, Mark Corkins, William P. Silver, and Donald Silver, MD, FACS

Effects of Antiplatelet Therapy on Injured Vein Grafts ..... 344
William C. Quist, MD, PhD, Frank W. LoGerfo, MD, FACS, and Christian C. Haudenschild, MD

Efficacy of Antiplatelet Agents in Promoting Patency and Reducing Anastomotic Hyperplasia of Endothelial Cell Seeded and Unseeded ePTFE Grafts ..... 348
Linda M. Graham, MD, FACS, Christopher K. Vincent, MD, Thomas E. Brothers, MD, Karyn A. Harrell, BA, David Darvishian, BS, Ruth Sell, William E. Burkel, PhD, and James C. Stanley, MD, FACS

CK2130: A New Inhibitor of Human Platelet Activation ..... 351
Russell F. Stahl, MD, David S. Warsaw, BS, Carol A. Fisher, BA, and V. Paul Addonizio, MD

## Chapter VI—Transplantation and Associated Immunology

Use of Anti-Tac Antibody in Primate Cardiac Xenograft Transplantation ..... 353
Matthew M. Cooper, MD, Robert C. Robbins, MD, Thomas A. Waldmann, MD, Otto A. Gansow, PhD, and Richard E. Clark, MD, FACS

Characterization and Immunosuppressive Efficacy of Monoclonal Antibodies to Seven Lymphocyte Activation Antigens .. 355
George Tellides, MBBCh, Margaret J. Dallman, BSc, DPhil, and Peter J. Morris, MBBS, PhD, FRACS, FRCS, FACS (Hon)

Effects of Anti-L3T4 and Anti-Lyt-2 Monoclonal Antibodies on Cardiac Allograft Survival in Presensitized Recipients ..... 358
Joren C. Madsen, MD, Kathryn J. Wood, BSc, DPhil, and Peter J. Morris, MBBS, PhD, FRACS, FRCS, FACS(Hon)

Does Interleukin-2 Receptor Targeted Therapy Influence Differentially the Host Responses Against Heart or Kidney Allografts? ..... 360
Haruhiko Ueda, MD, Jerzy W. Kupiec-Weglinski, MD, PhD, Kazuo Tanaka, MD, and Nicholas L. Tilney, MD, FRCS, FACS

Characterization of a T-Cell-Depleted Mouse Model That Uses Ricin Anti-Thy-1.2 Immunotoxin ..... 363
Eric S. Berens, MD, Mark W. Shelton, MD, Daniel A. Vallera, PhD, and Douglas W. Hanto, MD, PhD

Induction of Specific Transplant Tolerance in a Large Animal Model by Bone Marrow Transplantation ..... 365
Thoralf M. Sundt III, MD, Takao Suzuki, MD, Eric O. Kortz, MD, Michael Eckhaus, DVM, Ronald E. Gress, MD, and David H. Sachs, MD

Exogenous Interleukin-2 Reverses the Immunologic Unresponsiveness Induced by Antigen Pretreatment ..... 367
Robert L. Quigley, MD, DPhil, Kathryn J. Wood, DPhil, and Peter J. Morris, MB, BS, PhD, FACS (Hon)

In Vivo Immunosuppressive Effects of Murine Liver Cytosol ..... 370
Ginny L. Bumgardner, MD, Greg Dunn, BS, Sally Chen, BS, David Cahill, BS, and Nancy L. Ascher, MD, PhD, FACS

Suppression of Human Cytotoxic Effector Cells by FK-506 ..... 372
F. Melinda Carver, MS, Judith M. Thomas, PhD, J. Craig Matthews, BS, and Francis T. Thomas, MD, FACS

Synergism of FK-506 and Rabbit Antithymocyte Globulin in Prolongation of Xenografts ..... 374
Stephen Hsu, MD, Judith M. Thomas, PhD, and Francis T. Thomas, MD, FACS

Role of Interleukin-1 Within the Rejecting Allograft In Vivo ..... 377
Henri R. Ford, MD, Rosemary A. Hoffman, BS, Lori A. McIntyre, BS, and Richard L. Simmons, MD, FACS

Intravenous Delivery of Cyclosporin: Long-Term Dog Infusion by an Implantable Device ..... 379
Kemp H. Kernstine, MD, Bruce D. Wigness, BS, David E. R. Sutherland, MD, PhD, FACS, Frank D. Dorman, Thomas D. Rohde, MS, and Henry Buchwald, MD, PhD, FACS

Immune Effectors of Islet Allograft Primary Nonfunction ..... 382
Dixon B. Kaufman, MD, Jeffrey L. Platt, MD, Brian P. Priest, MD, Peter G. Stock, MD, and David E. R. Sutherland, MD, PhD, FACS

Pancreatic Islet Allo- and Xenotransplantation in Cynomolgus Monkeys and the Effect of Cyclosporin on Glucose Tolerance ..... 384
Mark D. Stegall, MD, John Chabot, MD, Collin Weber, MD, FACS, Keith Reemtsma, MD, FACS, and Mark A. Hardy, MD, FACS

Allotransplantation of Single Donor Purified Canine Islets Into the Spleen or Renal Subcapsular Space With Cyclosporin ..... 386
Mark S. Cattral, MD, Garth L. Warnock, MSc, FRCS(C), Ray V. Rajotte, PhD, PEng, and Norman M. Kneteman, MSc, FRCS(C)

Cyclosporin A Inhibits Insulin Secretion in the Dog ..... 389
H. Erik Wahlstrom, MD, Donald Endres, BS, Michael Lavelle-Jones, MB, ChB, FRCS, Oscar L. Bronsther, MD, Orville G. Kolterman, MD, and Abdul Rahim Moossa, MD, FACS

The Autologous Mixed Lymphocyte Reaction in Autoimmune Diabetes ..... 392
Michael A. Choti, MD, James F. Markmann, BA, Hiromitsu Kimura, MD, and Ali Naji, MD, PhD, FACS

Characterization of Immunoregulatory Lymphocytes in Autoimmune Diabetes ..... 394
Kenneth L. Brayman, MD, James F. Markmann, BA, Ali Naji, MD, PhD, FACS, and Clyde F. Barker, MD, FACS

Proliferation of Intraperitoneally Transplanted Microcarrier-Attached Rat Liver Cells....396
Gowthami Arepally, BA, Andrew Felcher, BA, Albert D. Moscioni, PhD, and Achilles A. Demetriou, MD, PhD, FACS

Prolongation of Function of Transplanted Microcarrier-Attached Hepatocytes by Ultraviolet Irradiation....398
John Phay, BA, Andrew Felcher, BA, Stanley M. Levenson, MD, FACS, and Achilles A. Demetriou, MD, PhD, FACS

Glucose, Maltose, Folic Acid, and Vitamin $B_{12}$ Absorption in Small Bowel Transplantation....399
Charles A. LaRosa, MD, Keichu Kimura, MD, and Bernard M. Jaffe, MD, FACS

Persistence of Dendritic Cells and Allograft Antigenicity Following Prolonged Interim Hosting of Cardiac Allografts in Rats....403
Venkat K. Rao, MD, FACS, Donald E. Burris, PhD, and Suzann M. Gruel, BS

Translocation of Potentially Infectious Antigen to Tracheobronchial Lymph Nodes Is Impaired in the Transplanted Lung....406
Richard H. Dal Col, MD, David B. Herlan, MD, Irvin L. Paradis, MD, Wayne Grurich, BS, and Bartley P. Griffith, MD, FACS

Xenogenic T-Cell Response in HLA-A2-Expressing Transgeneic Mice: Frequency of HLA-Specific Cytotoxic Precursors....409
Ai-Xuan T. Le, MD, Elizabeth Lacy, PhD, and Victor H. Engelhard, PhD

## Chapter VII—Oncology and Associated Immunology

Tumor-Specific Lysis by Tumor-Infiltrating Lymphocytes Derived From Melanomas ..... 413
Suzanne L. Topalian, MD, and Steven A. Rosenberg, MD, PhD, FACS

Augmentation of Tumor-Infiltrating Lymphocyte Cytotoxicity Following Activation With Anti-CD3 Antibodies..... 415
Deric D. Schoof, PhD, Sung-Eun Jung, MD, Anthony F. Massaro, BS, Richard E. Wilson, MD, FACS, and Timothy J. Eberlein, MD

Direct Antibody-Dependent Cellular Cytotoxicity: Evidence of Circulating Antibody-Armed Cytotoxic CD16+ NK/K Cells in Patients Infected With HIV-1..... 418
Douglas S. Tyler, MD, Chet L. Nastala, AB, H. Kim Lyerly, MD, Thomas J. Matthews, PhD, Dani P. Bolognesi, PhD, and Kent J. Weinhold, PhD

Anti-HIV-1 Immune Cytolysis Is Independent of Viral Envelope Glycosylation ..... 420
H. Kim Lyerly, MD, Michael A. Skinner, MD, Douglas S. Tyler, MD, Chet L. Nastala, AB, Thomas J. Matthews, PhD, Dani P. Bolognesi, PhD, and Kent J. Weinhold, PhD

Long-Term Murine Natural Killer Cell Recycling Is Impaired by Surgical Stress ..... 423
Raphael E. Pollock, MD, FACS, Susan Stanford, BS, and Eva Lotzová, PhD

Multiple Subsets of Heparan Sulfate Proteoglycan in Adhesion Sites of Metastatic and Primary Tumor Cells in a Malignant Tumor Model..... 424
Mary Ann Kosir, MD, and Lloyd A. Culp, PhD

Molecular Mechanisms of Interleukin-2 Induction of Tumor Necrosis Factor Gene Expression in Macrophages ..... 426
James S. Economou, MD, PhD, Richard Essner, MD, Kristina Rhoades, BS, William H. McBride, PhD, Sidney H. Golub, PhD, E. Carmack Holmes, MD, FACS, and Donald L. Morton, MD, FACS

Anticachectin Antibodies Attenuate the Carcass Lipid Depletion in Mice Bearing Lewis Lung Carcinoma ..... 429
Lyle L. Moldawer, PhD, Barbara E. Sherry, PhD, Michael A. Marano, MD, Yuman Fong, MD, He Wei, MD, Mark L. Silen, MD, Kevin J. Tracey, MD, Christopher Keough, BS, Anthony Cerami, PhD, and Stephen F. Lowry, MD, FACS

Regional Infusion Via Hepatic Artery and Portal Vein of FuDR of Rabbit VX-2 Hepatic Implants: Comparison With Angiotensin Modulation of Tumor Perfusion ..... 431
Thomas P. Trezona, MD, John A. Butler, MD, Aksel Nordestgaard, MD, and David A. State, MD, FACS

Hyperthermic Potentiation of Carboplatin-Induced Cytotoxicity: Potential Implications for Isolated Limb Perfusion for Melanoma ..... 433
Michael J. Edwards, MD, and Zahid H. Siddik, PhD

Effect of Calcium Channel Antagonists on Cellular Differentiation ..... 436
David Berger, MD, Michele Fuortes, MD, Christopher Hager, MD, and Monica Morrow, MD, FACS

Somatostatin Inhibits Growth of Human Small Cell Lung Carcinoma In Vivo ..... 438
Rusty A. Milhoan, MD, Judith L. Trudel, MD, John P. Lawrence, MD, Courtney M. Townsend, Jr., MD, FACS, and James C. Thompson, MD, FACS

The Expression and Membrane Association of a Cell Surface Marker in Colorectal Carcinoma Cells Is Related to Their Degree of Differentiation ..... 440
George W. Daneker, MD, Andrea J. Piazza, BS, Arthur M. Mercurio, PhD, and Glenn D. Steele, Jr., MD, PhD

Protection Against Experimental Liver Metastases by Murine Colon Cancer Cells (CT-26) Transfected With a Foreign (Viral) Gene ..... 443
Hans K. Schackert, MD, Toshiyuki Itaya, MD, and Philip Frost, MD, PhD

Growth Regulatory Factors for Human Colorectal Carcinoma Cells In Vitro ..... 445
Noel N. Williams, FRCS(I), Ulrich Rodeck, MD, John M. Daly, MD, FACS, and Meenhard Herlyn, DVM

Lymphokine-Activated Killer Cell Induction in the Peripheral Blood Mononuclear Cells of Colon Cancer Patients ..... 447
Edgar D. Staren, MD, Donald P. Braun, PhD, Jules E. Harris, MD, Steven D. Bines, MD, and Steven G. Economou, MD, FACS

T-Cells Bearing the Natural Killer Antigen Leu-19 Mediate Non-MHC-Restricted Activated Killing of Human Tumors ..... 449
Brett Gemlo, MD, Joseph Phillips, PhD, Diana Farmer, MD, Lewis Lanier, PhD, and Anthony Rayner, MD, FACS

Combination Lymphokine Therapy: Synergistic Antitumor Effects of Tumor Necrosis Factor, Interleukin-2, and Interferon-Alpha Against Established Murine Subdermal and Hepatic Tumors ..... 452
Joe K. McIntosh, MD, James J. Mulé, PhD, Jody Krosnick, BS, and Steven A. Rosenberg, MD, PhD, FACS

Enhancement of Lymphokine-Activated Killer Cell Cytotoxicity With Interleukin-2, Tumor Necrosis Factor-Alpha, and OKT3 Against Primary Lung Cancer Targets ..... 454
Stephen C. Yang, MD, Laurie-Owen Schaub, PhD, Elizabeth A. Grimm, PhD, and Jack A. Roth, MD, FACS

Effects of Chronic Intravenous Infusion of Prostaglandin $E_1$ or Indomethacin on Tumor Growth and Metastasis ..... 456
Lee M. Ellis, MD, Harry S. Sitren, PhD, Edward M. Copeland III, MD, FACS, and Kirby I. Bland, MD, FACS

Thromboxane Moderates Interleukin-2-Induced Pulmonary Dysfunction..... 459
Joseph M. Klausner, MD, Ian S. Paterson, MB, FRCS, C. Robert Valeri, MD, Timothy J. Eberlein, MD, David Shepro, PhD, and Herbert B. Hechtman, MD, FACS

Hypertriglyceridemia in Tumor-Bearing Rats Is Associated With Decreased Hepatic Malic Enzyme Activity ..... 462
Yoshikazu Noguchi, MD, Nadarajen A. Vydelingum, PhD, Kevin C. Conlon, MD, and Murray F. Brennan, MD, FACS

## Chapter VIII—Gynecology and Obstetrics

Treatment of Labial Adhesions in Prepubertal Girls ..... 464
David Muram, MD, and Sherman Elias, MD

Transabdominal Chorionic Villus Sampling for Prenatal Diagnosis ..... 466
Lee P. Shulman, MD, Sherman Elias, MD, FACS, Joe Leigh Simpson, MD, Donald Emerson, MD, Avirachan T. Tharapel, PhD, and Susan T. Rowe, BA

Is Appendectomy Essential in the Treatment of Ovarian Cancer? ..... 469
Thomas J. Moran, MD

Synergistic Cytotoxicity of DMSO-Antineoplastic Combinations Against P388 Leukemia in CD-$F_1$ Mice ..... 471
Rodney F. Pommier, MD, Eugene A. Woltering, MD, and William S. Fletcher, MD, FACS

Treatment Outcome and Survival Related to Histopathologic Risk Factors in Cancer of the Cervix Stage Ib and IIa ..... 473
Pierre A. Brioschi, MD, Hextan Y. S. Ngan, MD, Dragan Obradovic, MD, and Felix Krauer, MD

## Chapter IX—Neurological Surgery

The Product of Impact Velocity and Compression Depth Determines the Severity of Spinal Cord Injury ..... 478
Paul A. Kearney, MD, Stephen A. Ridella, MS, David C. Viano, PhD, Thomas E. Anderson, PhD, and Richard E. Burney, MD, FACS

Protective Effect of Flunarizine in Experimental Spinal Cord Ischemia.....481
Stephen H. Johnson, MD, and Geoffrey M. Graeber, MD, FACS

Human Glial Cell Production of Lipoxygenase Generated Eicosanoids: Potential Role in the Pathophysiology of Vascular Changes Following Traumatic Brain Injury.....483
Robert J. Hariri, MD, PhD, Jamshid B. G. Ghajar, MD, PhD, David P. Hajjar, PhD, Kenneth B. Pomerantz, PhD, Elissa Tomich, RN, and Russel H. Patterson, Jr., MD, FACS

Regional Polymeric Drug Delivery in a Rat Model of Alzheimer's Disease.....486
Matthew A. Howard, MD, Alan Gross, BA, M. Sean Grady, MD, H. Richard Winn, MD, FACS, and Marc R. Mayberg, MD

Hypertensive Manipulation and In-Line Doppler Flow Monitoring of Blood Flow Through Carotid Artery Shunts in the Goat.....489
John A. Becker, BS, Christopher M. Loftus, MD, Karl N. Detwiler, MD, Julius A. Silvidi, MD, and Daniel D. Bernstein, BS

Effect of Ischemic Stroke on Arachidonic Acid Metabolites.....491
Michael N. Bucci, MD, Keith L. Black, MD, and Julian T. Hoff, MD, FACS

Use of Allopurinol in Focal Cerebral Ischemia.....493
Donald S. Soloniuk, MD, Eddie Perkins, MS, and Joseph Ciacci, BS

Thrombus Prevention Without Systemic Anticoagulation:
Localized Polymeric Drug Delivery of Heparin .....496
Marc R. Mayberg, MD, Tomohisa Okada, MD,
and Don H. Bark, PhD

Timing of Surgery in Grade IV Aneurysmal
Subarachnoid Hemorrhage.....499
James I. Ausman, MD, PhD, Fady T. Charbel, MD,
Fernando G. Diaz, MD, PhD, Ghaus M. Malik, MD,
and Manuel Dujovny, MD

Excitotoxic Amino Acid Receptors in Temporal
Lobe Epilepsy.....501
Leslie D. Cahan, MD, FACS, James W. Geddes, PhD,
Ben Choi, MD, and Carl W. Cotman, PhD

The Response to Radiation Therapy of Astrocytoma
Diagnosed by Stereotactic Technique.....503
Michael L. Goodman, MD, and L. Dade Lunsford, MD, FACS

Stereotactic Radiosurgery for Acoustic Neurinomas .....505
L. Dade Lunsford, MD, FACS, and Michael L. Goodman, MD

Initial Experimental Results of a New Stereotaxic
Hyperthermia System.....507
M. Sean Grady, MD, Matthew A. Howard, MD,
William C. Broaddus, MD, PhD, H. Richard Winn, MD,
John A. Jane, MD, PhD, Rogers C. Ritter, PhD,
George T. Gillies, PhD, Elizabeth G. Quate, BS,
and Janelle A. Molloy, MS

Diphtheria Toxin or Cloned Fragment of Diphtheria
Toxin Linked to Growth Hormone-Releasing Factor:
Lack of Cytotoxicity to Somatotropes .....509
Charles J. Wrobel, MD, and Edward H. Oldfield, MD

## Chapter X—Ophthalmology

No Light Perception: Prognostic Significance in Acute Ocular Trauma ..... 512
Richard H. Fish, MD, Robert E. Morris, MD, and C. Douglas Witherspoon, MD

Conjunctival Transposition Flap for Pterygium Repair ..... 514
Samuel N. Garrett, MD, and Jimmy M. Carter, MD

Can Cardiac Surgery Provoke Vitreous Hemorrhage in Proliferative Diabetic Retinopathy? ..... 517
Kent W. Small, MD, and Edward G. Buckley, MD, FACS

Experimental Enophthalmos ..... 519
Raymond F. Morgan, MD, FACS, and Paul N. Manson, MD, FACS

## Chapter XI—Orthopaedic Surgery

Acute Exogenous Osteomyelitis: Role of Surgery in a Reproducible Model ..... 521
Richard P. Evans, MD, Carl L. Nelson, MD, Thomas A. Lange, MD, and Barry H. Harrison, BS

Enhanced Skeletal Healing by Percutaneous Injection of Bone Matrix and Bone Marrow ..... 523
Jeffrey J. Tiedeman, MD, Basil S. Strates, MD, PhD, Louis Lippiello, PhD, and John F. Connolly, MD, FACS

Effect of Interposition Material on Mechanical Behavior in Partial Physeal Resection in a Canine Model .....526
Matthew J. Bueche, MD, William A. Phillips, MD, Steven A. Goldstein, PhD, Jeffrey Gordon, BS, and Roger Best, BS

Ligament Augmentation Device: Effect on Healing Strength of Achilles Tendon Lacerations in Sheep .....529
Nancy C. Cullen, MD, James H. Roth, MD, FRCS(C), FACS, and Alexander C. McLaren, MD, FRCS(C)

Effect of Bupivacaine on Wound Healing in a Rabbit Model.....530
John D. Wyrick, MD, Dominic J. Bagnoli, BS, Steve J. Gabel, MD, Peter S. Barre, MD, and Kenneth S. Scher, MD, FACS

Tetanic Tension and Skeletal Muscle Length.....532
Gregory H. Chow, MD, Anthony V. Seaber, and William E. Garrett, Jr., MD, PhD

Dynamic Sonography, a New Method in the Diagnosis of Ankle and Knee Ligament Injuries .....534
Wilhelm Friedl, Eckhard Welk, Florian Glaser, and Andreas Hild

Dazmegrel-Induced Thromboxane Inhibition During Tourniquet Ischemia.....537
Sandra E. Glasson, MD, Anthony V. Seaber, and William E. Garrett, Jr., MD, PhD

Noninvasive Method for the Assessment of Anterior Tibial Compartment Syndrome .....539
Lee E. Ostrander, PhD, Bok Y. Lee, MD, FACS, and Weijia Cui, MS

Radiocarpal Articular Contact Characteristics of the Wrist With Simulated Schaphoid Instability.....542
Alexander D. Blevens, MD, Terry R. Light, MD, FACS, Warren S. Jablonsky, MD, Marc E. Guay, BS, Avinash G. Patwardhan, PhD, Douglas G. Smith, MD, and Rebecca Hollyfield, PhD

## Chapter XII—Otorhinolaryngology

Swallowing: Frame by Frame Analysis With Manofluorography.....545
David N. Ku, MD, PhD, Ping Ping Ma, BS, Fred M. S. McConnel, MD, and Danko Cerenko, MD, PhD

Regulation of Squamous Cell Carcinoma Cell Growth by Transforming Growth Factor-β and Epidermal Growth Factor.....548
Shawn C. Jones, MD, Cynthia J. Greaton, PhD, Mark Pettitjean, MD, Serge A. Martinez, MD, FACS, and Greg S. Schultz, PhD

Effects of Bacteria on Ciliated Epithelium In Vitro: Implications in Otitis, Rhinitis, and Sinusitis.....551
Jonathan L. Ferguson, MD, Thomas V. McCaffrey, MD, PhD, FACS, Eugene B. Kern, MD, FACS, and William J. Martin II, MD

Laser Deepithelialization of Skin Flaps.....553
Michael H. Weiss, MD, Pramod Bhatia, MD, FRCS, and Yosef P. Krespi, MD, FACS

Laser-Flo Monitoring of Negligible Skin Flap Perfusion .....555
John G. Phillips, MD, Richard E. Hayden, MD, FRCS(C), FACS,
and Patrick W. McLear, MD

Enhancement of Experimental Skin Flap Survival Using
Topical Calcium Channel Blockers With Dimethyl Sulfoxide .....557
Sai S. Ramasastry, MD, Anup Mathur, MD,
and Krishna Narayanan, MD

Modification of Collagen in Tissue Expansion .....559
Gregory V. Osetinsky, MD, Mitchell S. Marion, MD,
and Thomas V. McCaffrey, MD

Fundamentals of Cranial Base Surgery .....561
Ivo P. Janecka, MD, FACS, Laligam N. Sekhar, MD,
Carl H. Snyderman, MD, Neil F. Jones, MD,
and Kenneth C. Shestak, MD

## Chapter XIII—Pediatric Surgery

In Utero Hematopoietic Stem Cell Transplantation
in the Primate .....564
Timothy M. Crombleholme, MD, Michael T. Longaker, MD,
Jacob C. Langer, MD, Sheldon J. Bond, MD,
Nathan R. Slotnick, MD, Alice Tarantal, DVM,
Mitchell S. Golbus, MD, Esmail D. Zanjani, PhD,
and Michael R. Harrison, MD

Survival of Fetal and Neonatal Testis Congenic Grafts
Correlates With Reduced Major Histocompatibility
Complex Burden .....566
Edward M. Barksdale, Jr., MD, Mindy B. Statter, MD,
Daniel Parks, BA, and Patricia K. Donahoe, MD, FACS

Mucosal Thymidine Kinase Activity as a Marker
of Early Small Bowel Transplant Rejection .....569
Daniel H. Teitelbaum, MD, Roberta E. Sonnino, MD,
David J. Dunaway, BS, Michael Berend, BS,
and Richard P. Harmel, Jr., MD, FACS

Upregulation of MHC Class I: Effect on Growth
and LAK Sensitivity of Neuroblastoma.....572
Robert K. Sigal, MD, John V. Reynolds, FRCS(I),
J. F. Markmann, BA, J. Shou, MD,
E. Evantash, BA, M. Ziegler, MD, FACS,
A. Naji, MD, PhD, FACS, and J.M. Daly, MD, FACS

In Vitro Secretion of Tumor Necrosis Factor by
Endotoxin-Stimulated Newborn Rat Hepatic Macrophages
Is Reduced in Comparison to Adults .....575
Mark L. Silen, MD, David G. Hesse, MD,
Diane Felsen, PhD, Lyle L. Moldawer, PhD,
Anthony Cerami, PhD, and Stephen F. Lowry, MD, FACS

Epidermal Growth Factor Enhancement of Intestinal
Function: Differential Response of the Jejunum and Ileum.....577
R. Tom Temes, MD, Rostyk B. Storozuk, MS,
and Marshall Z. Schwartz, MD, FACS

Growth of Intestinal Neomucosa on a Gastric
Seromuscular Patch.....579
RoseMarie Lopez, MD, David Matthews, MD,
Gunwant Mallik, MD, Dennis Vane, MD,
Meredith Hull, MD, and Jay L. Grosfeld, MD, FACS

Pulmonary Function in Surgical Neonates.....582
Don K. Nakayama, MD, Marc I. Rowe, MD, FACS,
Rebecca Mutich, and Etsuro K. Motoyama, MD

Intracranial Pressure Monitoring During Extracorporeal Membrane Oxygenation in a Canine Model ..... 585
Richard G. Weiss, MD, and Frederick C. Ryckman, MD, FACS

Effect of Clindamycin and Metronidazole on Wound Healing..... 587
Aaron D. Bleznak, MD, Robert J. Sammartano, BS, Demetri Poulis, MD, and Scott J. Boley, MD, FACS

Intraosseous Fluids in the Initial Management of Hypovolemic Shock ..... 590
Alfonso L. Velasco, MD, Carlos Delgado-Paredes, MD, Josephine Templeton, MD, Carmen K. Steigman, MD, and John M. Templeton, MD, FACS

Preventing Adhesions in the Immature Rat ..... 592
Beverly J. Talbert, MD, David W. Tuggle, MD, Allyson A. Askew, MD, Tricia A. Perkins, BSN, Denise V. Taylor, BSN, and William P. Tunell, MD, FACS

## Chapter XIV—Plastic Surgery

Direct Assessment of Microvascular Blood Flow by Radionuclide Emission Vascular Scan ..... 595
Gerald M. Sloan, MD, John H. Miller, MD, David Barton, MD, Kent W. Gabriel, MD, Alan A. Bindiger, MD, Larry S. Nichter, MD, and John F. Reinisch, MD, FACS

Prefabrication of Flaps Using an Arteriovenous Bundle and Angiogenesis Factors ..... 597
Roger K. Khouri, MD, Kwan C. Tark, MD, PhD, and William W. Shaw, MD, FACS

Sternal Blood Flow Following Median Sternotomy and Mobilization of the Internal Mammary Arteries ..... 600
Alan E. Seyfer, MD, FACS

Autogenous Nonenteral Bladder Reconstruction ..... 603
Richard C. Sadove, MD, J. William McRoberts, MD, FACS, and Janet B. Rodgers, DVM

Soft Tissue Expansion to Elongate the Small Bowel ..... 604
Laura S. Finn, BS, Gregory Saggers, BS, Ernest K. Manders, MD, and Richard C. Rose, PhD

Reversal of Adriamycin-Impaired Wound Healing by Transforming Growth Factor-Beta ..... 608
Luke J. Curtsinger, MD, James D. Pietsch, BA, Gregory S. Schultz, PhD, Gregory L. Brown, MD, and Hiram C. Polk, Jr., MD, FACS

Effects of Ischemia and Venous Congestion on Ulcer Wound Healing: A New Model in the Rabbit Ear ..... 610
San Tae Ahn, MD, and Thomas A. Mustoe, MD

Possible Role of Calcium in Chronic Ulcer Etiology ..... 613
Anthony C. Sank, MBChB, Greg Gallegos, and George R. Martin, PhD

Differentiation and Formation of Bone Tissue in Cell Culture From Chick Embryo Mesenchymal Progenitor Cells ..... 616
Jay M. Pensler, MD, Bruce S. Bauer, MD, Mary Christensen, PhD, and Jonathan C. R. Jones, PhD

Morphologic Changes in the Craniofacial Skeleton Following Lateral Cranial Base Suture Expansion ..... 618
John A. Persing, MD, FACS, W. P. Wolcott, BS, V. Singh, BA, and J. M. Nachbar, MD

A Comparative Evaluation of Infection Rates in Burn Patients Treated on an Air-Fluidized Bed: Pediatric Burns Versus Adult Burns ..... 620
Linda G. Phillips, MD, John P. Heggers, PhD, Martin C. Robson, MD, Melva Kravitz, RN, PhD, Elizabeth Freshney, RN, David N. Herndon, MD, and Jane A. Boertman, BS

Cytochrome P-450: An Important Mediator of Lipid Peroxidation After Thermal Injury..... 622
Joseph V. Boykin, Jr., MD, Karl Byrne, MD, FRCS(I), Nancy H. Manson, PhD, and Lenora L. Murphy, MS

Skeletal Muscle Function Following Tourniquet Ischemia..... 624
Joel S. Fish, MD, William M. Kuzon, Jr., MSc, MD, Bruce R. Pynn, MSc, Michael J. Plyley, PhD, and Nancy H. McKee, MD, FRCS(C), FACS

The Potential Role of Polyamine Inhibition in Keloid Therapy..... 627
Bryan G. Forley, MD, Linda Huang, MD, Jorge Bartolome, PhD, Donald Serafin, MD, and Bruce Klitzman, PhD

Effect of Diabetic Rat Wound Fluid on Fibroblast Growth ..... 629
Andrea G. Zimbler, MD, Charles D. Mills, PhD, and Michael D. Caldwell, MD, PhD

Effects of Dimethylpolysiloxane on Fibroblast Proliferation ..... 632
Robert L. McCauley, MD

Use of a Nerve Guide and Purified Protein Growth Factor to Trophically Enhance Peripheral Nerve Regeneration..... 635
Peter G. Cordeiro, MD, Roger Madison, PhD, and Brooke R. Seckel, MD, FACS

Mitogenic Activity in Excisional Wounds in Rats and Its Stimulation by PDGF ..... 637
W. Thomas Lawrence, MD, Gregory Solomon, BS, G. William Link, PhD, and Albert J. Banes, PhD

An Improved Method of Wound Disruption and Measurement ..... 639
P. David Charles, BS, Kirk Williams III, BS, Larry C. Perry, Jeffrey A. Ditesheim, MD, Riley S. Rees, MD, FACS, and Jack Fisher, MD, FACS

Collagen Synthesis and Type Expression by Fetal Fibroblasts In Vitro ..... 642
Brian L. Thomas, MD, Thomas M. Krummel, MD, Michelle Melany, MD, John W. Cawthorn, BS, Jeffrey M. Nelson, MD, I. Kelman Cohen, MD, FACS, and Robert F. Diegelmann, PhD

Cellular and Molecular Events in Tendon Healing ..... 644
Harvey N. Himel, MD, MPH, Reuven Reich, PhD, and Mark Bolander, MD

Removal of HLA-DR Antigens in Human Epidermis by Complement-Dependent, Monoclonal Antibody-Mediated Cytotoxicity ..... 646
Lawrence J. Gottlieb, MD, Albert E. Cram, MD, William Dzwierzynski, MD, S. S. Chiang, MD, and Douglas Robson, BS

Wound Healing Defects in C3H Mice Bearing Syngeneic Breast Adenocarcinoma Tumors Are Prevented by Supplemental Vitamin A ..... 648
Jeffrey Weinzweig, MD, Jozef Mendecki, PhD, Norman Weinzweig, MD, Stanley M. Levenson, MD, FACS, Steven Blau, MD, FACS, and Eli Seifter, PhD

A Monoclonal Antibody That Blocks Neutrophil Adherence Reduces Tissue Injury in a Rabbit Ear Model of Free-Tissue Ischemia-Reperfusion.....651
Nicholas Vedder, MD, Robert Winn, PhD, John Harlan, MD, Karl-E. Arfors, PhD, and Charles Rice, MD, FACS

## Chapter XV—Reproductive Biology and Related Endocrinology

Long-Term Outcome Following Testicular Ischemia in the Rat.....654
John A. Stern, MD, Marie C. LaRegina, DVM, David R. Herbold, MD, PhD, Kim C. Tolman, BA, and Frank E. Johnson, MD, FACS

Carbon Dioxide Milliwatt Laser Vasovasostomy of Vas Deferens in Dogs .....656
E. James Seidmon, MD, FACS, Evan B. Krisch, MD, Steven J. Phillips, MD, Chik-Kwan Tang, MD, and Francis J. Shea, MD

Development of Rat Cavernosal Smooth Muscle Cell Culture and Its Response to Papaverine .....658
Andrew L. Freedman, MD, Suresh C. Sikka, PhD, and Jacob Rajfer, MD, FACS

Characterization of Rabbit Corpus Cavernosum In Vitro .....660
Kazem M. Azadzoi, MD, Inigo Saenz de Tejada, MD, Irwin Goldstein, MD, FACS, and Robert J. Krane, MD, FACS

Effect of Perineal Musculature on Penile Erection.....662
Randal A. Aaberg, MD, and Norman R. Zinner, MD, MS

Examination of Estrogen Receptors in Rabbit Bladder .....664
Timothy Bukowski, MD, Thomas Cangiano, BA,
Donna Scott, BA, Gerald Sufrin, MD,
and Linda Chamberlin, PhD

Effect of Uninhibited Bladder Contraction on
Muscarinic Receptor Density and Response to
Muscarinic Stimulation .....666
Robert M. Levin, PhD, Shinichiro Kitada, MD,
and Alan J. Wein, MD, FACS

Detrusor Insufficiency Syndrome, Type I:
Diagnostic Computation .....670
Sherif Sarky, MD, MS, and Jerry G. Blaivas, MD, FACS

Human Papillomavirus Typing Using DNA Probes
for the Diagnosis of Genital Condyloma .....671
Stephen A. Zderic, MD, Victor L. Carpiniello, MD, FACS,
Terrence R. Malloy, MD, FACS, Alan J. Wein, MD, FACS,
and Robert F. Rando, PhD

Effect of β-Estradiol on Bovine PTH Secretion
In Vitro .....673
Carol S. Connor, MD, Jerry Chern, MD,
Arlo S. Hermreck, MD, PhD, FACS,
and James W. Hamilton, PhD

## Chapter XVI—Urology

Control of Renal Injury With Fibrin Glue .....676
Gregory J. Jurkovich, MD, FACS,
Kevin T. Marble, MD, and John H. Farrer, MD

Renal Allograft Rejection: Pitfalls in Doppler Ultrasound Analysis ..... 678
Bernard G. Vasseur, MD, William H. Marks, MD, PhD, Kenneth J. W. Taylor, MD, PhD, and Marc I. Lorber, MD

Local Renal Cachectin/Tumor Necrosis Factor Production Is Associated With Acute Renal Pathology in Chronic Endotoxemia ..... 680
David G. Hesse, MD, Mark L. Silen, MD, Diane Felsen, PhD, Lyle L. Moldawer, PhD, George N. Davatelis, PhD, Anthony Cerami, PhD, Stephen F. Lowry, MD, FACS, and E. Darracott Vaughan, MD, FACS

TRPM-2: A Unique Gene Expressed During Renal Cell Damage ..... 682
John P. Connor, MB, BCh, Ralph E. Buttyan, PhD, Carl A. Olsson, MD, and Ihor S. Sawczuk, MD

Prognostic Value of Flow Cytometric Nuclear DNA Analysis in Stage C Prostate Carcinoma ..... 685
Ofer Nativ, MD, Yael Raz, Harry Z. Winkler, MD, Yoshio Hosaka, MD, Emmett T. Boyle, MD, Terry M. Therneau, PhD, George M. Farrow, MD, Robert P. Myers, MD, Horst Zincke, MD, and Michael M. Lieber, MD

Assessment of Metastatic Potential in Prostatic Carcinoma by Cell Motility ..... 687
G. Mark Doyle, MD, Yousuf Sharief, PhD, and James L. Mohler, MD

Somatic Deletion of Chromosome 6 DNA in Two Urologic Malignancies ..... 689
Daniel B. Rukstalis, MD, Glenn Bubley, MD, Jerome P. Richie, MD, FACS, and William C. DeWolf, MD, FACS

Monitoring the Efficacy of Retinoid Therapy in an Animal Model Using DNA Hyperploidy Measured by Quantitative Fluorescence Image Analysis.....693
George P. Hemstreet III, MD, PhD, Robert E. Hurst, PhD, and Richard C. Moon, PhD

A New In Vivo Model to Study Metastasis in Human Bladder Urothelium .....695
Adrian D. Joyce, MB, FRCS, FRCS(E), Kathleen M. Bulovas, BA, Ian C. Summerhayes, PhD, and Glenn D. Steele, Jr., MD, FACS

Cellular and Molecular Characterization of Helper/Inducer T-Cell Clone With Lytic Specificity Isolated From Renal Cell Carcinoma Ascitic Fluid.....698
Arie Belldegrun, MD, Attan Kasid, PhD, Michael Uppenkamp, MD, and Steven A. Rosenberg, MD, PhD, FACS

Overexpression of the Epidermal Growth Factor Receptor Gene in Human Renal Cell Carcinoma Tissues.....701
Leonard G. Gomella, MD, Eric R. Sargent, MD, Patrick Anglard, PhD, W. Marston Linehan, MD, FACS, and Attan Kasid, PhD